Claims

[c1]   What is claimed is:

1. A method of maintaining a private branch exchange (PBX) system, the PBX system comprising a first top-level host, the first top-level host being used for serving a plurality of IP-based PBX extensions, the method comprising:

utilizing a first medium-level host for checking if the first top-level host is capable of serving the IP-based PBX extensions; and

utilizing the first medium-level host for functioning as a second top-level host to substitute for the first top-level host if the first top-level host is unable to serve the IP-based PBX extensions.

[c2]   2. The method of claim 1 further comprising:

utilizing a bottom-level host for checking if the first medium-level host functions as the second top-level host; and

utilizing the bottom-level host for functioning as a second medium-level host to substitute for the first medium-level host if the first medium-level host functions as the second top-level host.

[c3]   3. The method of claim 2 wherein the first top-level host, first medium-level host, and the bottom-level host are connected to the Internet through an IP-sharing.

[c4]   4. The method of claim 2 wherein the first medium-level host periodically outputs a survival packet to inform the bottom-level host that the first medium-level host does not function as the second top-level host yet.

[c5]   5. The method of claim 2 wherein the bottom-level host periodically outputs a query packet to the first medium-level host, and the first medium-level host returns an acknowledge packet corresponding to the query packet to inform the bottom-level host that the first medium-level host does not function as the second top-level host yet.

[c6]   6. The method of claim 2 further comprising:
utilizing the first medium-level host to periodically backup data stored in the first top-level host when the first top-level host is capable of serving the IP-based PBX extensions; and
utilizing the second medium-level host to periodically backup data stored in the second top-level host when the first medium-level host functions as the second top-level host.

[c7]   7. The method of claim 1 wherein the first top-level host periodically outputs a survival packet to inform the first medium-level host that the first top-level host is capable of serving the IP-based PBX extensions.

[c8]   8. The method of claim 1 wherein the first medium-level host periodically outputs a query packet to the first top-level host, and the first top-level host returns an acknowledge packet corresponding to the query packet to inform the first medium-level host that the first top-level host is capable of serving the IP-based PBX extensions.

[c9]   9. The method of claim 1 wherein the first top-level host and first medium-level host are connected to the Internet through an IP-sharing.

[c10]   10. An apparatus of maintaining a private branch exchange (PBX) system, comprising:
a first top-level host for serving a plurality of IP-based PBX extensions in the PBX system; and
a first medium-level host connected to the first top-level host for checking if the first top-level host is capable of serving the IP-based PBX extensions, utilizing the first medium-level host for functioning as a second top-level host to substitute for the first top-level host if the first

top-level host is unable to serve the IP-based PBX extensions.

[c11]   11. The apparatus of claim 10 further comprising:
a bottom-level host connected to the first medium-level host for checking if the first medium-level host functions as the second top-level host, utilizing the bottom-level host for functioning as a second medium-level host to substitute for the first medium-level host if the first medium-level host functions as the second top-level host.

[c12]   12. The apparatus of claim 11 wherein the first top-level host, first medium-level host, and the bottom-level host are connected to the Internet through an IP-sharing.

[c13]   13. The apparatus of claim 11 wherein the first medium-level host periodically outputs a survival packet to inform the bottom-level host that the first medium-level host does not function as the second top-level host yet.

[c14]   14. The apparatus of claim 11 wherein the bottom-level host periodically outputs a query packet to the first medium-level host, and the first medium-level host returns an acknowledge packet corresponding to the query packet to inform the bottom-level host that the first medium-level host does not function as the second top-

level host yet.

[c15] 15. The apparatus of claim 11 wherein the first medium-level host periodically backups data stored in the first top-level host when the first top-level host is capable of serving the IP-based PBX extensions, and the second medium-level host periodically backups data stored in the second top-level host when the first medium-level host functions as the second top-level host.

[c16] 16. The apparatus of claim 10 wherein the first top-level host periodically outputs a survival packet to inform the first medium-level host that the first top-level host is capable of serving the IP-based PBX extensions.

[c17] 17. The apparatus of claim 10 wherein the first medium-level host periodically outputs a query packet to the first top-level host, and the first top-level host returns an acknowledge packet corresponding to the query packet to inform the first medium-level host that the first top-level host is capable of serving the IP-based PBX extensions.

[c18] 18. The apparatus of claim 10 wherein the first top-level host and first medium-level host are connected to the Internet through an IP-sharing.